EXECUTIVE SUMMARY

for

ASSESSMENT OF HEAVY-DUTY GASOLINE AND DIESEL VEHICLES IN CALIFORNIA: POPULATION AND USE PATTERNS

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As emissions from light-duty vehicles come under more stringent control, heavy duty vehicles (HDVs) will account for an ever larger share of total mobile source emissions. Accordingly, the Air Resources Board (ARB) wants accurate estimates of air pollutant emissions, especially emissions of oxides of nitrogen and particulates from HDVs. However, the ARB is hampered in this effort by the difficulty of accurately estimating HDV activities in California. The objectives of this study were to develop an improved methodology of estimating vehicle miles of travel (VMT) by California-based HDVs and out-of-state HDVs for various geographical subregions, and to estimate present and future truck VMT and HDV populations in California.

To achieve the above objectives, Pacific Environmental Services, Inc. (PES) reviewed ARB's VMT estimation method, existing VMT and vehicle registration data, and many previous studies and publications on truck usage. Based on this overview, PES proposed to develop a new estimation method, which would use as a primary data source CALTRANS VMT data (in place of DMV vehicle registration records), and to acquire auxiliary data through analysis of past traffic surveys and by conducting two special surveys. The following studies were done:

- A special truck traffic survey on 21 different routes selected from city and county roads (which are not under CALTRANS jurisdiction), and determined the vehicle mix in truck traffic on each type of road.

- A telephone questionnaire survey on vehicle usage of 622 randomly selected HDVs and estimated various use parameters for each of three HDV weight classes: light ($8,500 < GVW \leq 14,000$ lbs), medium ($14,000 < GVW \leq 33,000$ lbs) and heavy (over 33,000 lbs).

- An analysis of data from the 1976 Interstate Commerce Commission Survey, the 1971 Institute of Transportation and Traffic Engineer Survey, and the 1984 DMV vehicle registration records, and estimated out-of-state truck contributions to statewide truck VMT by light, medium and heavy HDVs, separately.

The CALTRANS VMT data and the auxiliary data were then merged in a computer program named "HDV", especially developed by PES, to estimate truck VMT for various geographical subregions and for HDV subcategories.

Specifically, truck VMT was estimated for each of the following subregions and subcategories: 58 counties, 14 air basins, and rural and urban roads; and 4 axle classes, 3 weight classes, 3 fuel types, and California-based and out-of-state trucks.

On a statewide basis, 36 million truck miles are driven daily on state highways (69%) and on city and county roads (31%). Of them, 15 million (41%) occur in rural areas and 21 million (59%) in the urban areas. Among the three weight classes, heavy HDVs travel the most (44%), followed by medium HDVs (35%) and light HDVs (21%). Of the three fuel types, diesel-powered trucks yield more VMT than gasoline-powered trucks (56% vs. 42%). Trucks powered by other types of fuel account for only 1% of truck VMT.

Out-of-state trucks travel on California roads 5.3 million vehicle miles per day, of which 81% are accounted for by heavy HDVs. The out-of-state truck contribution to statewide truck VMT is estimated to be 27% for heavy HDVs, 6% for medium HDVs and 3% for light HDVs. These out-of-state trucks account for 18% of all truck VMT on rural roads, 13% on urban roads and 15% for all roads.

The total number of California-based HDVs in 1983 is estimated to be 571,000, of which 263,000 (46%) are light HDVs, 171,000 (30%) are medium HDVs and 137,000 (24%) are heavy HDVs. In addition, there are 172,000 out-of-state trucks, which are presumed to be mostly heavy HDVs. The annual mileage accumulation rate is 13,000 for light HDVs and 23,000 for medium HDVs, but that for heavy HDVs is 76,000. A similar difference in the annual mileage accumulation rates is seen between gasoline-powered HDVs (27,000) and diesel-powered HDVs (70,600). Average unladen weights of light, medium and heavy HDVs are, respectively, 8,700, 10,000 and 23,700 pounds while average laden weights are 11,300, 21,400 and 68,200 pounds, respectively.

The truck population is predicted to grow from 571,000 HDVs in 1983 to 601,000 HDVs in 1990 and 644,000 HDVs in 2000, while the statewide truck VMT is predicted to grow from 36 million vehicle miles per day to 46 million in 1990 and 60 million in 2000.